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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,287	12/21/2001	Tadashi Tsuyuki	9319S-000308	4058

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HARNESSE, DICKEY & PIERCE, P.L.C.  
P.O. BOX 828  
BLOOMFIELD HILLS, MI 48303

EXAMINER
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DI GRAZIO, JEANNE A

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 07/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/032,287

Applicant(s)

TSUYUKI ET AL.

Examiner

Jeanne A. Di Grazio

Art Unit

2871

*Am*

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 4/15/04 & 12/16/03.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 3,5,6,13,17-27 and 32-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20,22,24,25,27,33,36,38-44,46 and 48 is/are allowed.
- 6) ☒ Claim(s) 3,5,6,13,17-19,21,23,26,32,34,35,37,45 and 47 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claims***

Claims 3, 5-6, 13, 17-27 and 32-48 are pending. Claims 1-2, 4, 7-12, 14-16 and 28-31 have been cancelled by Applicant's Amendment of December 16, 2003 and June 16, 2003.

### ***Priority***

Applicant claims priority to Japanese Patent Application No. 2000-392828 (Dec. 25, 2000).

### ***Election/Restrictions***

Applicant's election with traverse of Species A, claims 3, 13, 17-22, 25-27, 34, 36, 38-41 and 44-48 in the reply filed on April 15, 2004 is acknowledged. Applicant's arguments having been found persuasive, the requirement for restriction is withdrawn. Accordingly, claims 3, 5-6, 13, 17-27 and 32-48 are pending.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 5-6, 17, 19, 21, 34, 45 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minoura (US 6,433,847 B1) in view of Abe et al. (US 6,104,460).

As to claims 3, 17, 19, 45 and 47: Minoura has a base (Figure 2(b), substrate 7) and a light reflecting film formed on said base (collectively, 9, 10, and 11) wherein said pattern is formed by aligning at least one of a plurality of convexities and a plurality of concavities (collectively, 9, 10, 11), said convexities and concavities are pyramid shape in plane section (Figures 12 d and e and also Col. 21, Lines 30-38, "equivalent diamonds"), a spatial shape of said convexities or said concavities along one of two orthogonal axes that pass through said convexities or concavities is different from a spatial shape that extends along the other axis ((Figure 12(c), also Figure 1, inclined plane 9a).

The Examiner interprets Applicant's recitation of "a spatial shape of said convexities or said concavities along one of two orthogonal axes that pass through said convexities or concavities is different from a spatial shape that extends along the other axis" to mean that the pyramidal shape is irregular – meaning that the slopes are of different steepness, or saw-tooth.

Minoura does not appear to specifically point out that the reflective surface has both directional and scattering properties.

Abe teaches a reflective electrode surface exhibiting both directional and scattering properties. Specifically, Abe teaches that a reflective electrode having a saw-tooth shape exhibits a directional property because of its unevenness (Col. 7, Lines 37-44).

Abe combines the directional and scattering properties in one reflective structure because to do so improves throughput and reduces manufacturing costs by reducing the number of steps needed to separately make a directional and scattering surface (See Col. 2, Lines 7-11).

Abe is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to combine the directional and scattering properties in one reflective structure because to do so improves throughput and reduces manufacturing costs by reducing the number of steps needed to separately make a directional and scattering surface (See Col. 2, Lines 7-11).

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Minoura in view of Abe for increased throughput and reduced manufacturing costs.

As to claims 5-6, 21 and 34: Minoura has a base (Figure 2(b), substrate 7) and a light reflecting film formed on said base (collectively, 9, 10, and 11) wherein said pattern is formed by aligning at least one of a plurality of convexities and a plurality of concavities (collectively, 9, 10, 11), said convexities and concavities are pyramid shape in plane section (Figures 12 d and e and also Col. 21, Lines 30-38, "equivalent diamonds"), wherein one side of a spatial shape of said convexities bisected by at least one of the two orthogonal axes that pass through said convexities or concavities is asymmetric with the other side thereof ((Figure 12(c), also Figure 1, inclined plane 9a).

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The Examiner interprets Applicant's recitation of "wherein one side of a spatial shape of said convexities bisected by at least one of the two orthogonal axes that pass through said convexities or concavities is asymmetric with the other side thereof" to mean that the pyramidal shape is irregular – meaning that the slopes are of different steepness, or saw-tooth.

Minoura does not appear to specifically point out that the reflective surface has both directional and scattering properties.

Abe teaches a reflective electrode surface exhibiting both directional and scattering properties. Specifically, Abe teaches that a reflective electrode having a saw-tooth shape exhibits a directional property because of its unevenness (Col. 7, Lines 37-44).

Abe combines the directional and scattering properties in one reflective structure because to do so improves throughput and reduces manufacturing costs by reducing the number of steps needed to separately make a directional and scattering surface (See Col. 2, Lines 7-11).

Abe is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to combine the directional and scattering properties in one reflective structure because to do so improves throughput and reduces manufacturing costs by reducing the number of steps needed to separately make a directional and scattering surface (See Col. 2, Lines 7-11).

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to modify Minoura in view of Abe for increased throughput and reduced manufacturing costs.

Claims 23, 32 and 35 rejected under 35 U.S.C. 103(a) as being unpatentable over Minoura (US 6,433,847 B1).

As to claims 23, 32 and 35: Minoura has a base (Figure 2(b), substrate 7) and light reflecting film on the base and a plurality of convexities and concavities (pyramid shape) formed and arranged in a reflecting pattern on a surface of a light reflecting film (collectively, 9, 10, and 11).

Minoura does not appear to specifically point out that an amount of light reflected on said reflection pattern, a profile of the amount of light along one of two orthogonal axes that pass through said convexities or said concavities is different from the profile of light along the other of two orthogonal axes; however, the Examiner interprets this limitation to mean that because of the irregular shape of the reflective layer, the profile of amount of light measured with respect to each axis is different. This is due to the irregular shape of the reflective surface- that of an irregular pyramid with slopes of different steepness.

While Minoura does not specifically point this limitation out, it may be implied that the profiles of amount of light are different because of the irregular reflective surface of Minoura as shown in Figure 12(c) for example.

Minoura is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to differ light profiles based on the irregular shapes on the reflective surface for both black and white display and a high contrast ratio.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystals at the time the invention was made to vary the profile of light based on the irregularity of the reflective surface realizing both black and white display and high contrast ratio (Col. 4, Lines 64-67 and Col. 5, Lines 1-2).

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Claims 13, 18, 26 and 37 rejected under 35 U.S.C. 103(a) as being unpatentable over Molsen (US 6,573,959 B1) in view of Minoura (US 6,433,847 B1).

As to claims 13, 18, 26 and 37: Molsen has a reflective optical element and associated methods for its manufacture. The reflective structure of Molsen is saw-tooth (Figures 9, 10 a and b). Molsen has the steps of forming a light reflecting film on a surface of a base and employing a mask to form at least one of a plurality of convexities and a plurality of concavities on the surface of the light reflecting film (Col. 9, Lines 9-30). In Molsen, a shape of the mask pattern for the convexities or concavities along one axis of two orthogonal axes that pass through the convexities or concavities is different from the shape that extends along the other axis (Id.) / a shape of one side of a mask pattern of said mask for said plurality of convexities or said plurality of concavities that is bisected by at least one of two orthogonal axes that pass through said convexities or concavities is asymmetric with the other side thereof (Id.).

Molsen does not appear to specify that the convexities or concavities are pyramid shape in plane section.

Minoura has pyramidal shaped structures (Figures 12 d and e and also Col. 21, Lines 30-38, "equivalent diamonds").

Molsen uses this configuration in part for a multi-color display with a high contrast ratio and that can be easily manufactured (Col. 5, Lines 1-2).

Molsen is evidence that ordinary workers in the field of liquid crystals would have found the reason, suggestion, and motivation to form pyramidal shaped structures for a multi-colored display with high contrast ratio that can be easily manufactured.



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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Molsen in view of Minoura for a multi-color display with a high contrast ratio and that can be easily manufactured.

***Allowable Subject Matter***

Claims 20, 22, 24, 25, 27, 33, 36, 38-44, 46 and 48 are allowed.

The following is an examiner's statement of reasons for allowance:

As to claims 20, 22, 24, 25, 27, 33, 36, 38-44, 46 and 48, relevant prior art of record did not disclose, alone or in combination, a light reflecting film having a surface that is tear drop shaped.

The closest combination is United States Patent 6,573,959 B1 (to Molsen) in view of United States patent 6,433,847 B1 (to Minoura) and further in view of Japanese Patent Application No. 10-020290 (to Hoshi Junichi et al.). While Junichi discloses a quadratic cone, the cone appears to lack the requisite curved structure of a tear drop having an apex and curved or bulbous end.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Response to Arguments***

Applicant's arguments filed December 16, 2003 have been fully considered but they are not persuasive.

1. Applicant's only arguments regarding the light reflecting film having convexities and concavities that are pyramid shape in plane section focus upon the Minoura reference. Applicant argues "... Minoura merely teaches saw-tooth shaped projections." (Amendment at Page 12 of 16).

The Examiner respectfully reminds Applicant that the shapes taught in Minoura are not just saw-toothed but "equivalent diamonds", for example (Figures 12 d and e and also Col. 21, Lines 30-38, "equivalent diamonds").

Furthermore, the Examiner respectfully reminds Applicant of the Examiner's interpretation of the claim language "[T]he Examiner interprets Applicant's recitation of "a spatial shape of said convexities or said concavities along one of two orthogonal axes that pass through said convexities or concavities is different from a spatial shape that extends along the other axis" to mean that the pyramidal shape is irregular – meaning that the slopes are of different steepness, or saw-tooth." (Office Action of September 16, 2003 at Page 3, for example). In essence, Applicant agrees with the Examiner's interpretation.

Applicant has not addressed any other elements of the claims.

2. Applicant argues that "[N]either Molsen nor Minoura teach employing a mask to form the convexities and concavities on a surface of the insulating layer." (Amendment at Page 13 of 16). This is not correct. Molsen teaches using a mask to develop a photoresist on a substrate (entire patent).

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Because Applicant has not argued any other elements of the claim language, Applicant is deemed to have acquiesced to the remainder of the rejections.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeanne A. Di Grazio whose telephone number is (571)272-2289.

The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeanne Andrea Di Grazio  
Patent Examiner  
Art Unit 2871

JDG



TARIFUR R. CHOWDHURY  
PRIMARY EXAMINER